Section 600 - Air Quality

Section 610.00 – Introduction

Air quality impacts can result from various ITD activities and projects including transportation-related projects (vehicle emissions) and maintenance, construction, or demolition of facilities (particulates and other emissions). Handling and disposal of asbestos (as a result of construction and maintenance activities) is discussed in **Section 347 (Under Construction)**.

610.01 Summary of Requirements. All transportation projects requesting federal funding must be analyzed for air quality. The Idaho Department of Environmental Quality Air monitors air quality in Idaho. DEQ's activities in protecting air quality in Idaho are in response to the requirements of:

- the federal Clean Air Act;
- the state Implementation Plan for the Control of Air Pollution;
- yearly agreements between the state and the Environmental Protection Agency (EPA);

Fugitive dust is particulate matter generated by natural or human activities that is suspended in the air by wind. Projects that require earthwork or otherwise have the potential to create fugitive dust are required to utilize best management practices (BMPs) to control dust at ITD project sites.

Section 620.00 - Applicable Statutes and Regulations

Federal and State air quality legislation and regulations related to transportation are online at EPA's home page: http://www.epa.gov/air/oarregul.html

620.01 National Environmental Policy Act. The National Environmental Policy Act (NEPA), 42 USC 4231, requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations such as impacts on air quality are given due weight in project decision-making. Federal implementing regulations are at 23 CFR 771 (FHWA) and 40 CFR 1500-1508 (CEQ). For details see Section 200**.**

620.02 Clean Air Act (CAA).
The Clean Air Act (CAA) of 1970, 42 USC 7401 et seq., was enacted to protect and enhance air quality and to assist state and local governments with air pollution prevention programs.

620.03 Clean Air Act Amendments (CAAA).
The Clean Air Act Amendments of 1990 are intended to significantly affect transportation decision-making, not only to achieve air quality goals but also to affect broader environmental goals related to land use, travel mode choice, and reduction in vehicle miles traveled. A key section of the CAAA relating to conformity is Title I, Provisions for the Attainment and Maintenance of National Ambient Air Quality Standards (NAAQS). See EPA home page referenced above.

620.04 Intermodal Surface Transportation Efficiency Act (ISTEA).
The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and subsequent legislation including the Transportation Efficiency Act for the 21st Century (TEA 21), adopted in 1998 (Public Law 105-178) offer tools to help transportation and air quality decision makers carry out the CAAA mandates. For statutes and implementing regulations, see the Federal Register home page http://www.access.gpo.gov/nara/cfr/ click on code of Federal Regulations, search by title and section or the FHWA home page http://www.fhwa.dot.gov/.

620.05 Federal Conformity Regulations.
Under the CAAA, the Federal Department of Transportation (USDOT) cannot fund, authorize, or approve actions to support programs or projects in non attainment or maintenance areas, unless first found to conform to the State Implementation Plan (SIP). With USDOT concurrence, the EPA has issued regulations pertaining to the criteria and procedures for transportation conformity 40 CFR 93. Exempt projects are listed in 40 CFR 93.126. FHWA regulations for statewide and District transportation improvement programs and plans are defined in 23 CFR 450, Planning Assistance and Standards. Federal regulations can be accessed from the following web site:

Section 630.00 - Policy Guidance

The primary purpose of Idaho's Congestion Mitigation and Air Quality (CMAQ) Program is to fund projects, planning, and programs in air quality non-attainment and maintenance areas, as well as areas of concern for ozone (O_3), carbon monoxide (CO), and particulate matter (PM) which reduce transportation-related emissions. The policy and action strategies are covered in the

DEQ Enforcement Manual Procedures available on the Idaho DEQ website (**Air Quality**) or at: http://www.fhwa.dot.gov/ Click on Legislation and Regulations, then FHWA Directives and Policy Memorandums, then FHWA Technical Advisories, then T6640.8A.

Section 640.00 - MOUs and MOAs

640.01 Fugitive Dust from Construction Projects

Section 650.00 - Technical Guidance

See 650.01 - Project Level Air Quality Screening Analysis
See *650.02* - Mobile Source Air Toxics

650.01 PROJECT LEVEL AIR QUALITY SCREENING, ANALYSIS, AND DOCUMENTATION FOR ROADWAY PROJECTS IN IDAHO

EFFECTIVE: September 4, 2001
REVISED: July 13, 2005

Abbreviations and Acronyms

Abbreviations and acronyms used in this chapter are listed below. Others are found in the general list in the appendix.

BMP	Best Management Practices
CAA	Clean Air Act (Federal)
CAAA	Clean Air Act Amendments
CAWA	Clean Air Idaho Act
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO	Carbon Monoxide
HC	Hydrocarbons
ISTEA	Intermodal Surface Transportation Efficiency Act
LOS	Level of Service- A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience.
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO_x	Nitrogen Oxides
O_3	Ozone
PM_{10}	Respirable or fine particulate matter, smaller than 10 micrometers in diameter
$PM_{2.5}$	Respirable or fine particulate matter, smaller than 2.5 micrometers in diameter
PPM	Parts per million

PSD	Prevention of Significant Deterioration
SIP	State Implementation Plan
TCM	Transportation Control Measure
TIP	Transportation Improvement Program
TSP	Total Suspended Particulates

INTRODUCTION

Transportation projects can create localized impacts on air quality through the changes they introduce to the volume, location and character of motor vehicle traffic. The frequency and magnitude of these impacts, which manifest themselves as health risks and a general decreased quality of life, can be identified through monitoring and projected through modeling.

It is the responsibility of the Idaho Transportation Department (ITD) to satisfactorily identify and assess the potential impacts of all federally funded highway transportation projects in the State of Idaho. Similarly, it is the responsibility of the Federal Highway Administration (FHWA) to assure compliance with applicable laws and regulations. A process flow chart for addressing project level air quality requirements on all Federally funded highway transportation projects in Idaho is provided in **Attachment A.**

In consideration of the importance of air quality as an environmental and health issue, and the complexity of this subject from both a regulatory and analysis standpoint, it was determined through discussion between ITD, FHWA and the Idaho Department of Environmental Quality (IDEQ) that the following guidance should be prepared to provide an overview of project level air quality analysis. Specific issues addressed in this guidance document are:

1. Regulatory Basis for Project Level Air Quality Analysis
2. Pollutants of Concern
3. Level of Consideration for Air Quality
4. Screening Guidance
5. Analysis Guidance
   · Emission Factors Modeling
   · Dispersion Modeling
6. Mitigation Considerations
7. Documentation
   · Background Documentation
   CO Documentation
   · PM10 Documentation

REGULATORY BASIS FOR PROJECT LEVEL AIR QUALITY ANALYSIS

Consistent with the National Environmental Policy Act (NEPA) and as further detailed in 23 CFR Part 771, projects using federal-aid funds and/or requiring FHWA approval actions must be evaluated for the potential impacts that such actions will have on the human environment. Included among the elements of the human environment, to be considered as part of the evaluation, is air quality.

In addition to the NEPA based imperative referenced above, the Federal Clean Air Act (CAA) has established specific procedures and limitations for evaluating transportation projects in designated air quality non-attainment and maintenance areas. These procedures, generally referred to as the “conformity regulations”, are outlined in 42 U.S.C. Part 7401 (et. seq.) and are further detailed in Federal regulations (40 CFR Part 93) and Idaho State Administrative Procedures (IDAPA 58.01.01).

Though separate from the NEPA process, the conformity regulations likewise require ITD to assess the potential air quality impacts of transportation projects on the human environment. Two notable differences exist between the project level air quality requirements under NEPA and those under the CAA. First, NEPA applies to Federal projects irrespective of location whereas the CAA applies to projects within specifically identified areas. Second, NEPA and its implementing regulations provide limited detail on the direction and criteria for conducting project level air quality analyses whereas the CAA and its implementing regulations provide substantial detail.

POLLUTANTS OF CONCERN

Of the seven Federal criteria pollutants identified in the CAA, the two currently applicable to Idaho transportation projects and programs are carbon monoxide (CO) and particulate matter with a diameter equal to or less than 10 microns (PM_{10}). Within the State of Idaho there are currently five federally designated air quality non-attainment/maintenance areas for CO and/or PM_{10} as follows:

CO	**Designation**
Northern Ada County	Limited Maintenance

PM 10	**Designation**
Northern Ada County	Maintenance
Portneuf Valley PM_{10} (Pocatello)	Non-attainment
Fort Hall PM10 (Tribal Lands)	Non-attainment
City of Pinehurst	Non-attainment
City of Sandpoint	Non-attainment

In addition to the above listed areas, the IDEQ has identified the following locations as being air quality areas of concern based on monitoring:

Lewiston Urban Area
Canyon County

Characteristics and health effects of CO and PM10 are as follows:

CO

CO is an odorless, colorless gas produced from incomplete combustion of carbon fuels and is commonly found in the emissions of smoke stacks and automotive tailpipes. Health effects of CO include reducing the flow of oxygen in the bloodstream, thus making it particularly dangerous to persons with heart disease. Exposure to CO impairs visual perception, manual dexterity, learning ability, and performance of complex tasks.

PM_{10}

PM10 is comprised of suspended particles originating from smoke stack and automotive tailpipe emissions as well as from migration and re-entrainment of dust due to wind, automobiles, and other sources of disturbance. Health effects of PM_{10} include irritation and damage to the respiratory system. This can result in difficulty breathing, induce bronchitis and aggravate existing respiratory disease. Exposure to particulates impacts individuals with chronic pulmonary or cardiovascular disease, people with influenza or asthma, children and elderly persons.

Particulates aggravate breathing difficulties, damage lung tissue, alter the body's defense against foreign materials, and can lead to premature mortality.

LEVEL OF CONSIDERATION FOR AIR QUALITY

Air quality should be a consideration for all transportation projects. The level of consideration (including analysis and documentation) appropriate for a given project will depend on a number of factors but particularly the air quality status and history of the area, the nature of the project and the projected traffic growth and characteristics.

For Federally designated non-attainment areas, air quality is a priority issue. In addition, areas not currently designated as non-attainment but which have been identified by IDEQ as being air quality areas of concern warrant additional attention beyond that reserved for projects in other locations. Finally, projects having characteristics potentially leading to air quality impacts should be given additional attention regardless of their location.

CO emissions attributed to transportation projects are principally the result of tailpipe emissions. Locations of greatest potential for elevated concentrations of CO are intersections, interchanges and other similar sites experiencing particularly high vehicle densities and slow velocities. PM_{10} emissions attributed to transportation projects are principally the result of re-entrained road dust. Consistent with this, PM_{10} is correlated to the roadway functional classification with lower classification roadways being characterized as having a greater potential for re-entrained dust. Owing to the complex nature of PM_{10} generated from roadways, there is currently no EPA approved project level air quality analysis model or methodology and with that, no formal quantification or analysis of projects for this pollutant.

SCREENING GUIDANCE

The following screening process has been developed for the purpose of identifying highway projects which, based on their type, configuration and projected traffic volume, will not result in emission concentrations approaching or exceeding the NAAQS. Projects satisfying the screening criteria are judged to have no significant adverse air quality impacts and, where applicable, conform to the State Implementation Plan (SIP).

This process and its criteria, as detailed below, apply to all Federally funded transportation projects statewide. Furthermore, it satisfies both the NEPA requirements of 23 CFR Part 771, and the project level conformity requirements detailed in 40 CFR Part 93,) and Idaho State Administrative Procedures (IDAPA 58.01.01).

<u>Criteria:</u>

1. Exempt Areas: (Applicable to CO only)
Projects in all areas of the State except Ada County, Canyon County, and the City of Lewiston.

2. Exempt Projects: (Applicable to both CO and PM_{10})

Project types **identified as being exempt from air quality analysis per 40 CFR 93.126 (See Attachment B**).

3. Level of Service: (Applicable to CO only)
Projects for which the **design year traffic volume will result in an operational LOS (LOS) of "C" or better** for any intersection in or directly affected by the project.

4. Traffic Volume: (Applicable to CO only)
Projects for which **the forecast traffic volumes at the project estimated completion date will be as follows:**

FIGURE 1

SCREENING VOLUMES FOR: ***Ada County, Canyon County and Lewiston***

*Projects in Ada County, Canyon County, or Lewiston having forecast traffic volumes at the **project estimated completion date** which are in excess of the values in this table will warrant a detailed project level air quality analysis for carbon monoxide.*

(N/A denotes no screening volume exists and no consideration of CO is necessary)

Approach Configuation: (lane types and/or number of lanes per approach)	**Peak Hour and Daily Screening Volumes**	
	Directional Design Hour Volume (DDHV) (Highest DDHV At Project Completion Date Among All Intersecting Roadways)	**Average Annual Daily Traffic (AADT)** (Highest AADT At Project Completion Date Among All Intersecting Roadways)
3 X 3: One Through Lane with a Single Turn Lane	N/A	N/A
5 X 5: Two Through Lanes with a Single Turn Lane	1,500	33,000
6 X 6: Two Through Lanes with Two Turn Lanes	1,600	35,000
7 X 7: Two Through Lanes with Three Turn Lanes	1,700	38,000
9 X 9: Three Through Lanes with Three Turn Lanes	1,800	40,000

Traffic volume forecasts utilized for screening purposes are to be obtained from ITD. ITD District Offices can request traffic volume information and forecasts directly from ITD Transportation Planning Division-Traffic Survey and Analysis Section. This section will coordinate with metropolitan planning organizations as necessary to provide the appropriate traffic volumes and forecasts.

Projects satisfying one or more of the above criteria will not require a project level analysis. Recommended narrative to discuss projects of this type in the NEPA document is provided in the "Documentation" section of this guidance.

A detailed explanation of the underlying assumptions and procedures through which the above criteria were established are attached **(See Attachment C**).

ANALYSIS GUIDANCE

Projects failing to satisfy the previously described screening criteria will warrant a project level analyses for CO utilizing the current approved EPA emissions and dispersion models (see note following) and the CAL3QHC dispersion model. This analysis should be conducted for the **estimated project completion date**.

In an effort to simplify the analysis process as well as to improve the accuracy and consistency of the results, this section provides an outline of procedures, assumptions and input values to be used in Idaho.

As noted previously, owing to the absence of models or methodologies for project level PM_{10} analysis, no such analysis will be expected for PM_{10}. Recommended narrative to discuss projects of this type in the NEPA document is provided in the "Documentation" section of this guidance. Therefore, no further discussion if PM_{10} is included in this section.

Emission Factors Modeling

The emissions model is used to establish emission factors representative of the roadway, traffic and environmental conditions anticipated for the project under consideration. An outline of the input values and file structures recommended for Idaho is provided in **Attachment D**. The outputs from the emissions model to be used in the dispersion modeling process are the Composite CO Emission Factor (gm/mi) and the Idle Emission Factor (gm/hr).

Dispersion Modeling

The Dispersion model is used to project the concentration of pollutants at specified locations potentially impacted by existing and proposed transportation facilities. Owing to the high concentration of vehicles at intersections and the associated higher emissions factors at low speeds, it has been found that intersections are the critical locations for emissions concentrations and impacts. Furthermore, since CO concentrations typically increase with the traffic volume and congestion, the focus of the analysis should be based on what is judged to be the most congested intersection in or directly affected by the project.

The sequence for assessing project level CO is as follows:

1. Identify the most congested intersection within or directly affected by the project. Determine whether CO concentrations for this intersection are forecast to stay within the 8-hour standard. If this test is satisfied no further analysis is necessary.

2. If CO concentrations in the initial analysis are forecast to exceed the 8-hour standard additional sites of high traffic congestion (and exceeding the previously discussed

screening criteria) should also be assessed to establish the extent of the project's air quality impacts to the immediate area.

3. For those locations in which the analysis forecasts CO concentrations in excess of the NAAQS, an analysis of the No-Build alternative should be conducted for the same analysis year.

The specific sites analyzed for emissions are referred to as receptors. As a general rule, receptors should be located where the maximum total project concentration is likely to occur and where the general public is likely to have access. Examples of reasonable receptor sites include:

1. Sidewalks;
2. Vacant lots adjacent to intersections;
3. Parking lots; and
4. Sensitive buildings and properties, such as residences, hospitals, nursing homes, schools, and playgrounds.

In addition to locating a receptor adjacent to the actual intersection, receptors should also be located at intervals of 25 meters to mid-block (or the end of the predicted intersection queue as appropriate). Furthermore, owing to limitations of the modeling process, the receptors should be located no closer than the edge of the mixing zone (3.01 meters outside the traveled way).

Recommended Idaho-specific input values for the dispersion model are provided in **Attachment E.** The Idaho Department of Environmental Quality (IDEQ) provides specific input data required in Attachment E. The IDEQ contact information is listed in **Attachment F**.

MITIGATION CONSIDERATIONS

Project level air quality mitigation should be considered for projects demonstrated to have a potential for adverse impacts on air quality. For projects in which the CO concentrations are predicted to exceed the 8-hour standard, specific mitigation measures should be identified for consideration. For projects in which the CO concentrations are predicted to exceed both the 8-hour standard and the predicted concentrations for the No-Build scenario, mitigation measures should be identified and implemented wherever feasible.

Specific project level CO mitigation measures to consider include:

1. Design configuration changes (e.g., adding or deleting turn lanes or medians, realignment, etc.)
2. Roadway system changes (e.g., one way couplets versus two way streets, etc.).
3. Operational changes (e.g., signal coordination improvements. etc.)

For projects having a potential to generate high levels of PM_{10} during construction operations, particularly, those located within PM10 air quality non-attainment areas and IDEQ areas of concern, measures to control PM10 should be identified and implemented wherever feasible.

Specific project level PM_{10} measures to consider during construction operations include:

1. Watering requirements.
2. Re-vegetation requirements.
3. Burning restrictions.
4. Hauling restrictions and requirements.
5. Plant (asphalt, cement, crushing, etc.) operation restrictions.
6. Street sweeping.

DOCUMENTATION

Upon completing the assessment of the potential air quality impacts of a transportation project, the findings, along with any proposed or committed mitigation measures are to be documented in the project NEPA document. Recommended levels of documentation and wording to be used are as follows:

Background Documentation:

For all projects the following statements should be provided as part of the project NEPA documentation:

"The project (is, is not) within a Federally designated air quality (non-attainment, maintenance) area for (CO and/or PM_{10})."

"The project (is, is not) within an IDEQ identified air quality area of concern for (CO and/or PM_{10})."

CO Documentation:

1. Screened Projects:

For projects satisfying one more of the screening criteria, no analysis is necessary and documentation in the NEPA document should be as outlined below. In the event that a project satisfies more than one screening criteria, documentation need only address one of the applicable criteria below:

a. Exempt Areas

For all projects other than in Ada County, Canyon County, and the City of Lewiston, air quality modeling and analysis has demonstrated that no forecast traffic volume will exceed the CO standard. Documentation for projects located in these areas should be as follows:

"This project does not include or directly affect any roadways for which forecast traffic numbers will exceed the screening volumes as determined by ITD Project Level Air Quality Screening Procedure. It can therefore be concluded that the project will have no significant adverse impact on air quality as a result of CO emissions."

b. Exempt Criteria (addresses both CO and PM_{10})

Consistent with 40 CFR 93.126 (Table 2, Exempt Projects), projects identified as being exempt from air quality analysis or consideration will, by their character, have minimal potential to impact air quality. Therefore no air quality analysis is warranted and no consideration of mitigation measures is necessary. Documentation for exempt projects should be as follows:

"This project has been identified as being exempt from air quality analysis in accordance with 40 CFR 93.126 (Table 2, Exempt Projects). It can therefore be concluded that the project will have no significant adverse impact on air quality."

c. LOS Criteria
Consistent with 40 CFR 93.123, projects identified as satisfying the LOS criteria are not forecast to experience traffic congestion levels resulting in CO concentrations exceeding the current NAAQS. Therefore, no air quality analysis is warranted and no consideration of mitigation measures is necessary. Documentation for projects that meet the LOS criteria should be as follows:

"This project is forecast to experience traffic congestion level (LOS C) or better at all intersections within or directly affected by the project. It can therefore be concluded that the project will have no significant adverse impact on air quality as a result of CO emissions."

d. Volume Criteria
Projects in Ada County, Canyon County, or Lewiston having forecast traffic volumes at the **project estimated completion date** which are in excess of the screening volumes (See Figure 1) will warrant a detailed project level air quality analysis for carbon monoxide. Documentation for projects that meet the volume criteria should be as follows:

"This project does not include or directly affect any roadways for which forecast traffic numbers will exceed the screening volumes as determined by ITD Project Level Air Quality Screening Procedure. It can therefore be concluded that the project will have no significant adverse impact on air quality as a result of CO emissions."

2. Analyzed Projects
For all projects in which an air quality analysis has been conducted, documentation in the NEPA document should be provided as outlined below. In addition, a tabular summary of results should be provided in the main body of the NEPA document. This table should include concentration levels by analysis year and scenario (build scenario and no-build scenario where called for), background levels, and the 8-hour standard. Finally a schematic of the analyzed intersections including peak hour traffic volumes, receptor sites and roadway dimensions should also be provided in the NEPA document. At the request of FHWA, the complete analysis shall be provided either as a separate technical report or as an appendix to the NEPA document.

a. Projects satisfying the 1 hour and the 8-hour standard Criteria
For projects in which the project level air quality analysis forecasts the CO concentrations to be less than the CO standards (35 ppm 1-hour; 9 ppm 8-hours), no consideration of mitigation measures is necessary. Documentation for this situation should be as follows:

"A project level air quality analysis for CO has been conducted for the project and no receptor sites are forecast to experience concentrations in excess of the current 1 hour and 8-hour standard. It can therefore be concluded that the project will have no significant adverse impact on air quality as a result of CO emissions."

b. Projects Satisfying the Build/No-Build Criteria
For projects in which the project level air quality analysis forecasts the CO concentrations to be greater than the CO standards but less than the No-Build scenario,

discussion of the analysis outcome along with consideration of mitigation measures should be provided.

"A project level air quality analysis of CO has been conducted for the project and has forecast that the following receptor sites may experience concentrations in excess of the EPA 1 hour and/or 8-hour standard(s)." (Also, provide a summary of the results in the project NEPA documentation).

For the receptor sites in which the CO concentrations are forecast to exceed the standards, *"A comparison with the No-Build scenario forecasts the CO concentrations for the proposed project to be less than for the No-Build scenario."* (Also, provide a description of location(s) forecast to have CO concentrations in excess of the CO standards in the project NEPA documentation. Discuss the potential adverse impacts on the location(s) forecast to have CO concentrations in excess of the CO standards in the project NEPA documentation).

"Mitigation measures to consider for the purpose of reducing the forecast CO concentrations include the following:" (List project specific mitigation measures and their estimated benefits in the project NEPA documentation).

c. Failure to Meet either Standard or Build/No-Build Criteria
For projects in which the project level analysis forecasts the CO concentrations to be greater than both the CO standards and the No-Build scenario, discussion of the analysis outcome along with commitments to specific mitigation measures should be provided. Appropriate documentation for this situation should read as follows:

"A project level air quality analysis of CO has been conducted for the subject project and has forecast that the following receptor sites may experience concentrations in excess of the current 1-hour or 8-hour CO standards." (Provide summary of results in the project NEPA documentation).

For the receptor sites forecast to exceed the CO standards, *"A comparison with the No-Build Scenario finds that the concentrations under the Build scenario will exceed those of both the CO standards and the No-Build scenario."* (Provide a description of location(s) forecast to have CO concentrations in excess of the CO standards in the project NEPA documentation. Discuss the potential adverse impacts on the location(s) forecast to have CO concentrations in excess of the CO standards in the project NEPA documentation).

*"Mitigation measures to consider for the purpose of reducing the forecast CO concentrations include the following:" (*List project specific mitigation measures and their estimated benefits in the project NEPA documentation).

PM_{10} Documentation:

1. Screened Projects:
Exempt Projects (addresses both CO and PM 10):
Consistent with 40 CFR 93.126 (Table 2, Exempt Projects), projects identified as being exempt from air quality analysis or consideration will, by their character, clearly have minimal potential to impact air quality. Therefore no air quality analysis is warranted and no consideration of mitigation measures is necessary. Documentation for such projects can be limited to the following:

"The project has been identified as being exempt from air quality analysis in accordance with 40 CFR 93.126 (Table 2, Exempt Projects). It can therefore be concluded that the project will have no significant adverse impact on air quality."

2. Other Projects:
As noted previously, there is no analysis model or methodology for project level PM10 analysis. The documentation should acknowledge this fact and identify any proposed or committed mitigation measures as follows:

"There are currently no EPA approved models or methodology available to analyze individual projects for their potential to cause or contribute to PM10 concentrations. Emissions due to the construction operations for this project will be mitigated by implementation of the following best practices measures:" (List project specific mitigation measures in the project NEPA document).

Glossary

Carbon Monoxide (CO) – A by-product of the burning of fuels in motor vehicle engines. Though this gas has no color or odor, it can be dangerous to human health. Motor vehicles are the main source of carbon monoxide, which is generally a wintertime problem during still, cold conditions.

Conformity – Projects are in conformity when they do not (1) cause or contribute to any new violation of any standards in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area (EPA's Conformity Rule).

Criteria Pollutants – Carbon monoxide, sulfur dioxide, particulate matter, ground level ozone, lead, and nitrogen dioxide.

Exempt Projects – Listed in federal and state regulations (40 CFR 93.126 and WAC 173-420-110). These projects improve safety, mass transit, or air quality, or preserve or maintain existing transportation facilities, and are considered to have a neutral impact on air quality.

Fugitive Dust – Particulate matter that is suspended in the air by wind or human activities and does not come out of a stack.

Hot-spot Analysis – An estimate of likely future localized CO and PM_{10} pollutant concentrations and a comparison of those concentrations to the National Ambient Air Quality Standards. Hot-spot analysis assesses impacts on a scale smaller than the entire non-attainment or maintenance area (for example, congested roadway intersections and highways or transit terminals), and uses an air quality dispersion model to determine the effects of emissions on air quality (40 CFR 93.101). See 40 CFR 93.116 for analysis procedure.

Maintenance Area – An area that previously was considered a "Non-attainment Area" but has achieved compliance with the NAAQS.

Non-attainment Area – Area that exceeds health-based NAAQS for certain air pollutants designated by the EPA. Current non-attainment areas are shown at http://mapserver.deq.idaho.gov/Website/emissions/viewer.htm.

Ozone (O_3) – A highly reactive form of oxygen that occurs naturally in the earth's upper atmosphere (stratosphere). Stratospheric ozone is a desirable gas that filters the sun's ultraviolet (UV) radiation. Ozone at ground level is not emitted directly into the air; instead it forms in the atmosphere as a result of a series of complex sunlight-activated chemical transformations between oxides of nitrogen (NO_x) and hydrocarbons that together are precursors of ozone.

Particulate Matter (PM_{10} and $PM_{2.5}$) – Includes both naturally occurring and man-made particles with a diameter of less than 10 microns or 2.5 microns respectively. Sources of particulate matter include sea salt, pollen, smoke from forest fires and wood stoves, road dust, industrial emissions, and agricultural dust. Particles of this size are small enough to be drawn deep into the respiratory system where they can contribute to infection and reduced resistance to disease.

District Significant Project – A transportation project (other than an exempt project) that serves District transportation needs (such as access to and from the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, or transportation terminals as well as most terminals themselves). Such projects would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guide way transit facilities that offer an alternative to District highway travel (40 CFR 93.101).

State Implementation Plan (SIP) – Framework for complying with federal law (40 CFR Part 51) requiring that the state take action to quickly reduce air pollution to healthful levels in a non-attainment area, and to provide enough controls to keep the area clean for 20 years. States have to develop a SIP that explains how it will do its job under the CAA. A SIP is a collection of the regulations a state will use to clean up polluted areas. EPA must approve the SIP, and if a SIP is not acceptable, EPA can take over, enforcing the CAA in that state. ITD projects must conform to the SIP before the FHWA and the EPA can approve construction.

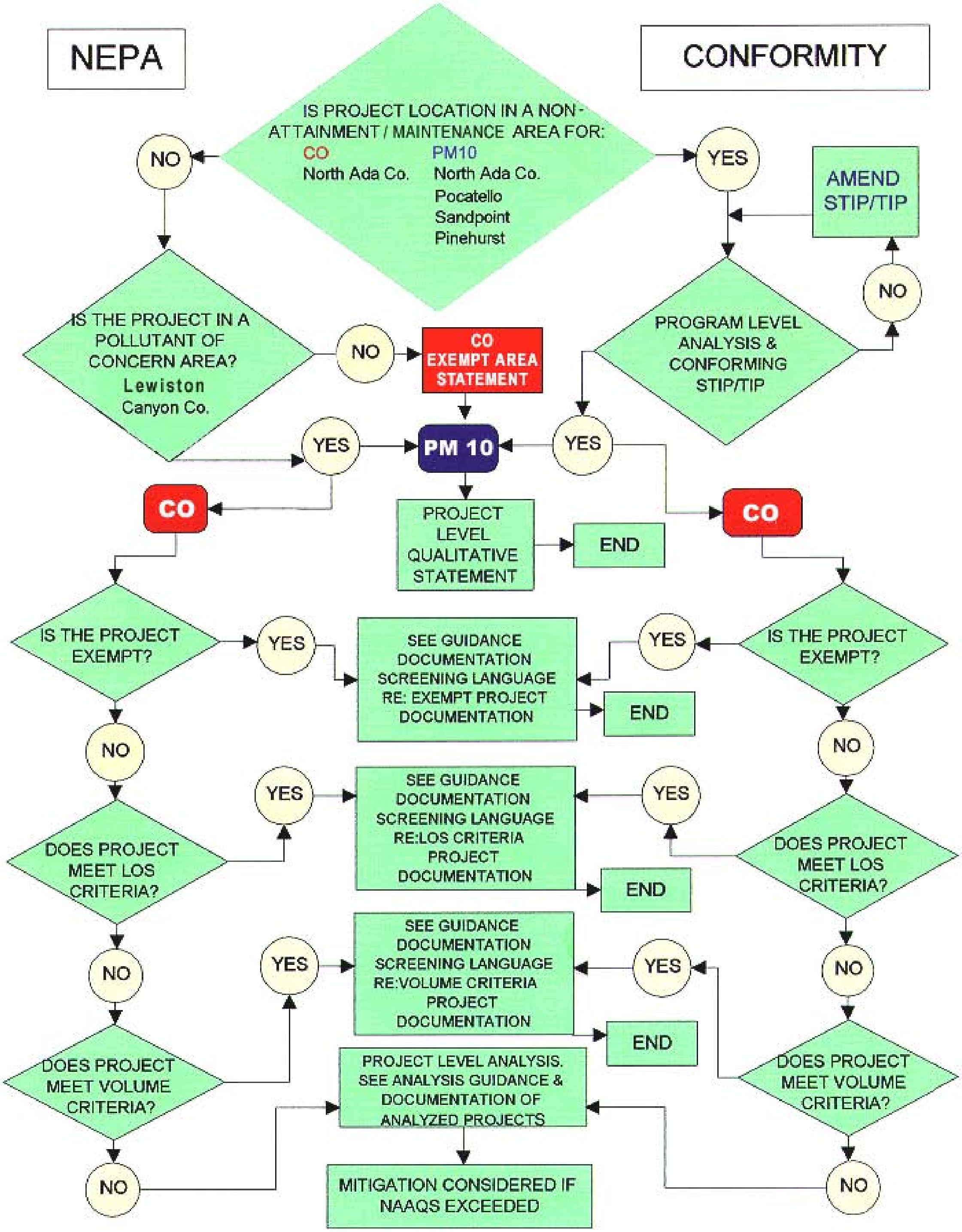
Transportation Improvement Program (TIP) – A staged, multiyear intermodal program of transportation projects covering a metropolitan planning area which is consistent with the state and metropolitan transportation plan, and developed pursuant to 23 CFR Part 450. The entire program must conform to the NAAQS in order for any federal funding to be granted for individual projects.

Section 660.00 - Attachments/Exhibits

ATTACHMENT A:

IDAHO'S AIR QUALITY ANALYSIS PROCESS FLOW CHART

AIR QUALITY - CO AND PM10



ATTACHMENT B

PROJECT TYPES EXEMPT FROM AIR QUALITY ANALYSIS

PROJECT TYPES EXEMPT FROM AIR QUALITY ANALYSIS

Environmental Protection Agency § 93.126
…prior to a positive conformity determination, and that project sponsors must comply with such commitments.
(d) If the MPO or project sponsor believes the mitigation or control measure is no longer necessary for conformity, the project sponsor or operator may be relieved of its obligation to implement the mitigation or control measure if it can demonstrate that the applicable hot-spot requirements of § 93.116, emission budget requirements of § 93.118, and emission reduction requirements of § 93.119 are satisfied without the mitigation or control measure, and so notifies the agencies involved in the interagency consultation process required under § 93.105. The MPO and DOT must find that the transportation plan and TIP still satisfy the applicable requirements of §§ 93.118 and/or 93.119 and that the project still satisfies the requirements of § 93.116, and therefore that the conformity determinations for the transportation plan, TIP, and project are still valid. This finding is subject to the applicable public consultation requirements in § 93.105(e) for conformity determinations for projects.

§ 93.126 Exempt projects.
Notwithstanding the other requirements of this subpart, highway and transit projects of the types listed in Table 2 of this section are exempt from the requirement to determine conformity. Such projects may proceed toward implementation even in the absence of a conforming transportation plan and TIP. A particular action of the type listed in Table 2 of this section is not exempt if the MPO in consultation with other agencies (see § 93.105(c)(1)(iii)), the EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project) concur that it has potentially adverse emissions impacts for any reason. States and MPOs must en-sure that exempt projects do not interfere with TCM implementation. Table 2 follows:

TABLE 2—EXEMPT PROJECTS
Safety

Railroad/highway crossing.
Hazard elimination program.
Safer non-Federal-aid system roads.
Shoulder improvements.
Increasing sight distance.
Safety improvement program.
Traffic control devices and operating assistance other than signalization projects.
Railroad/highway crossing warning devices.
Guardrails, median barriers, crash cushions.
Pavement resurfacing and/or rehabilitation.
Pavement marking demonstration.
Emergency relief (23 U.S.C. 125).
Fencing.
Skid treatments.
Safety roadside rest areas.
Adding medians.
Truck climbing lanes outside the urbanized area.
Lighting improvements.
Widening narrow pavements or reconstructing bridges (no additional travel lanes).
Emergency truck pullovers.

Mass Transit
Operating assistance to transit agencies.
Purchase of support vehicles.
Rehabilitation of transit vehicles 1 .
Purchase of office, shop, and operating equipment for existing facilities.
Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.).
Construction or renovation of power, signal, and communications systems.
Construction of small passenger shelters and information kiosks.
Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facili-ties, stations, terminals, and ancillary structures).
Rehabilitation or reconstruction of track structures, track, and trackbed in existing rights-of-way.
Purchase of new buses and rail cars to re-place existing vehicles or for minor expansions of the fleet 1 .
Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771.

Air Quality
Continuation of ride-sharing and van-pooling promotion activities at current levels.
Bicycle and pedestrian facilities.

Other
Specific activities which do not involve or lead directly to construction, such as:
Planning and technical studies.
Grants for training and research programs.
Planning activities conducted pursuant to titles 23 and 49 U.S.C.
Federal-aid systems revisions.
Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action.
Noise attenuation.

§ 93.127
Emergency or hardship advance land acquisitions (23 CFR 712.204(d)).
Acquisition of scenic easements.
Plantings, landscaping, etc.
Sign removal.
Directional and informational signs.
Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities).
Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, location or capacity changes.

NOTE: 1 In PM_{10} non-attainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

§ 93.127 Projects exempt from regional emissions analyses.
Notwithstanding the other requirements of this subpart, highway and transit projects of the types listed in Table 3 of this section are exempt from regional emissions analysis requirements. The local effects of these projects with respect to CO or PM10 concentrations must be considered to determine if a hot-spot analysis is required prior to making a project-level conformity determination. These projects may then proceed to the project development process even in the absence of a conforming transportation plan and TIP. A particular action of the type listed in Table 3 of this section is not exempt from regional emissions analysis if the MPO in consultation with other agencies (see § 93.105(c)(1)(iii)), the EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project) concur that it has potential regional impacts for any reason. Table 3 follows:

TABLE 3—PROJECTS EXEMPT FROM REGIONAL EMISSIONS ANALYSES

Intersection channelization projects.
Intersection signalization projects at individual intersections.
Interchange reconfiguration projects.
Changes in vertical and horizontal alignment.
Truck size and weight inspection stations.
Bus terminals and transfer points.

§ 93.128 Traffic signal synchronization projects.
Traffic signal synchronization projects may be approved, funded, and implemented without satisfying the requirements of this subpart. However, all subsequent regional emissions analyses required by §§ 93.118 and 93.119 for transportation plans, TIPs, or projects not from a conforming plan and TIP must include such regionally significant traffic signal synchronization projects.

§ 93.129 Special exemptions from conformity requirements for pilot pro-gram areas.
EPA and DOT may exempt no more than six areas for no more than three years from certain requirements of this subpart if these areas are selected to participate in a conformity pilot program and have developed alternative requirements that have been approved by EPA as an implementation plan revision in accordance with § 51.390 of this chapter. For the duration of the pilot program, areas selected to participate in the pilot program must comply with the conformity requirements of the pilot area's implementation plan revision for § 51.390 of this chapter and all other requirements in 40 CFR parts 51 and 93 that are not covered by the pilot area's implementation plan revision for § 51.390 of this chapter. The alternative conformity requirements in conjunction with any applicable state and/or federal conformity requirements must be proposed to fulfill all of the requirements of and achieve results equivalent to or better than section 176(c) of the Clean Air Act. After the three-year duration of the pilot program has expired, areas will again be subject to all of the requirements of this subpart and 40 CFR part 51, subpart T, and/or to the requirements of any implementation plan revision that was previously approved by EPA in accordance with § 51.390 of this chapter.
[64 FR 13483, Mar. 18, 1999]

Subpart B—Determining Conformity of General Federal Actions to State or Federal Implementation Plans

SOURCE: 58 FR 63253, Nov. 30, 1993, unless otherwise noted.

ATTACHMENT C

ASSUMPTIONS, METHODOLOGY AND RESULTS FOR DEVELOPING SCREENING VOLUMES IN THE 2005 UPDATE

Excerpt from:

ASSUMPTIONS, METHODOLOGY, RESULTS AND RECOMMENDATIONS FOR DEVELOPING SCREENING VOLUMES IN THE 2005 UPDATE TO:

"PROJECT LEVEL AIR QUALITY SCREENING, ANALYSIS, AND DOCUMENTATION FOR ROADWAY PROJECTS IN IDAHO"

By: R. Scott Frey, Transportation Engineer
FHWA Idaho Division

Date: February 24, 2005**INTRODUCTION:**

The Idaho Transportation Department (ITD) currently assesses all Federal-aid transportation projects for potential impacts due to carbon monoxide. The procedures and criteria used to conduct these assessments are referred to as the "Project Level Air Quality Screening, Analysis and Documentation For Roadway Projects in Idaho" or PLAQ for short. The PLAQ procedures, which were developed by the ITD in cooperation with the Federal Highway Administration (FHWA) and the Idaho Department of Environmental Quality (IDEQ), were formally adopted and implemented by the State in September 2001 and are available on the ITD website at:

www.ITD.Idaho.Gov/Manuals/Downloads/aqsp.htm.

Among the features of Idaho's 2001 PLAQ procedures is its use of the following screening criteria to identify those projects which do not warrant a project level air quality modeling analysis for Conformity and/or NEPA purposes:

1. Exempt Projects:
   Project types identified as being exempt from air quality analysis in EPA's Conformity Regulations (40 CFR 93.126).

2. Level of Service (LOS):
   Projects for which the design year traffic volume is forecast to have an operational LOS of "C" or better (as defined in the 2000 Highway Capacity Manual referred to as HCM2000) for any intersections in or directly affected by the project.

3. Traffic Volume:
Projects for which the design year average annual daily traffic (AADT) of any roadway in or directly affected by the project and having at grade signalized intersections does not exceed the following:

a. Northern Ada County Carbon Monoxide Nonattainment/Maintenance Area:
20,000 vehicles per day

b. Remainder of the State:
15,000 vehicles per day

The third screening criteria, above, involving traffic volume allows the State to quickly determine which projects have current or forecast traffic conditions that warrant an actual modeling analysis (using EPA's CAL3QHC dispersion model) to establish whether the project has the potential to result in or contribute to concentrations of carbon monoxide exceeding the National Ambient Air Quality Standards (NAAQS).

Since Idaho's adoption of its PLAQ procedures, an important development in air quality analysis methods has been the updating of EPA's MOBILE Model (MOBILE 5b has been superseded by MOBILE 6.2). The likely outcome of this updating of the emissions model is that it will result in changes in the emissions factors representative of Idaho's vehicle fleet.

An additional change since 2001 has been a progressive change in the character of the vehicle fleet. Over the course of time, the average year of construction of the vehicles comprising the vehicle fleet in Idaho increases. Along with this updating of the vehicle fleet has been an improvement in the extent and effectiveness of the emissions controls for the fleet which, in turn, justifies a lower average emission factor.

To address the above changes, a reassessment of the PLAQ screening volumes has been conducted. The specific elements in this reassessment are as follows:

1. **Assumptions:**
Review and as necessary update the assumptions for input data and procedures used for the application of EPA's MOBILE 6.2 and CAL3QHC models.

2. **Methodology:**
Review and as necessary modify the existing methodology used to develop the screening volumes.

3. **Results:**
Summarize and discuss the results of the emissions modeling for the selected intersection configurations and volumes.

4. **Recommendations:**

Provide recommendations for updating the screening volumes in the PLAQ procedures.

ASSUMPTIONS:

The EPA MOBILE 6.2 and CAL3QHC models require a substantial amount of input data to represent the various factors affecting air quality including climate, topography, land use, roadway characteristics, traffic conditions, and vehicle characteristics. An overview of the assumptions and default values used in the application of the above models for developing screening volumes is as follows:

<u>Mobile Model:</u>

Areas of Application:
The 2001 PLAQ procedures provide screening volumes and model input parameters for the following two areas:

1. Boise/Northern Ada County

2. The rest of the State

The Boise/Northern Ada County area clearly warrants a separate Mobile model run because of the need to represent the emission affects of Ada County's vehicle inspection and maintenance program.

For the 2005 update to the PLAQ procedures DEQ has recommended that following four areas be modeled separately:

1. Boise/Northern Ada County,

2. Nampa/Canyon County,

3. The City of Lewiston, and

4. The rest of the State.

The basis for this recommendation is the State's carbon monoxide air quality monitoring results.

Input Data:
Mobile model input parameters recommended for revision in the 2004 update are:

1. Temperature

2. Humidity

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3. Velocity

4. I/M Program

Temperature: The input temperature for the MOBILE 5b model used to develop the 2001 procedures was a single ambient temperature representing the average daily low for the month of January over a ten year period. The procedures specified a temperature for Boise/Northern Ada County (31.4 F) and the rest of the State (28.8 F). The above values were based on the general assumption that carbon monoxide levels are inversely proportional to air temperature. While the above is a reasonable assumption there are other meteorological factors that come into play. Furthermore, the Mobile 6 now requires the input of a minimum and maximum temperature rather than a single average temperature.

DEQ researched this subject and reviewed its monitoring data and through this effort has developed a new list of recommended temperatures corresponding to the average highest carbon monoxide levels in the month January for Boise/Northern Ada County, Nampa/Canyon County, and Lewiston. For the remainder of the state, the recommended minimum and maximum temperatures are based on the average January low and high temperatures for all counties (excluding Ada, Canyon and Nez Perce). Details are provided DEQ's January 8, 2004 memo on this subject (See Attachment A).

Humidity: Humidity is an optional input that has no affect on carbon monoxide concentrations. If no humidity input value is provided, the model will assume a value of 75 grains of water per pound of dry air. While this value is unreasonably high for the temperature range being evaluated in conjunction with highest seasonal carbon monoxide levels (Idaho winter conditions), it is of no consequence to the outcome and therefore can be permitted.

Velocity: Velocity is an important input value for establishing appropriate emissions factors for a given facility type and mode of operation. These emission factors, in turn, become key inputs to the CAL3QHC dispersion model which forecasts the actual concentrations of pollutants at specified locations. In the 2001 PLAQ procedures, the velocities assumed in developing the screening volumes were 0 mph for queued vehicles and 27 mph for free-flowing traffic in Boise/Northern Ada County, and 30 mph for free flowing traffic in other areas of the State. Similarly, for modeling of actual projects under the 2001 procedures, the velocity for queued vehicles was 0 mph and the velocity for free-flowing traffic was dependent on the project-specific traffic analysis.

For the 2005 update to the PLAQ procedures, it was determined from a review of the current Highway Capacity Manual, that 30 mph is a reasonable free-flowing velocity to assume statewide for the purpose of developing screening volumes (ref. Exhibits 10-3 and 10-5, HCM2000). For queued vehicles, EPA now recommends an assumed velocity of 2.5 mph (ref. EPA Mobile 6 Guidance). For modeling of actual projects, the queued vehicle speed will likewise be assumed as 2.5 mph and the free-flowing vehicle speed will continue to be based on the project-specific traffic analysis.

I/M Program: The Boise/Northern Ada County continues to be covered by a vehicle inspection and maintenance program. At the time of the 2001 PLAQ procedures, the program was classified as and represented in the Mobile model as a "test only" program. Recent changes to the inspection maintenance program and to the way in which it is represented in the Mobile model now dictate that the program be classified as "test only at 2500 rpm" for pre-1996 vehicles and "test only on-board diagnostic" for 1996+ vehicles. This change is reflected in both the development of screening volumes and in the input recommendations for modeling of actual projects.

A complete listing of the recommended MOBILE 6.2 inputs including default values for use either in developing screening volumes or for developing project level emissions factors in instances where site specific data is not known are presented in Attachment B.

CAL3QHC MODEL:

Areas of Application:
The 2001 PLAQ procedures provide two screening volumes; one for the Boise/Northern Ada County area and one for "the rest of the State". The above stratification was established to correspond with the separate emissions Mobile model runs for these same two areas. For the purposes of modeling actual projects, the 2001 procedures further stratified the State into the following areas:

1. Boise/Northern Ada County

2. Nampa/Canyon County

3. Lewiston

4. Other Areas of the State

After the above application scheme was established and in use, it became evident that it did not adequately represent the "other areas of the State" strata in that it was assigning the most rural areas of the State the highest background levels, thus making the analysis of rural areas unreasonably conservative.

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As a result, for the 2005 update to the PLAQ procedures, DEQ has recommended that application of the CAL3QHC model be further stratified as follows:

1. Boise/Northern Ada County

2. Nampa/Canyon County

3. Lewiston

4. Other Large Urban Areas

5. Other Small Urban Areas, and

6. Rural Areas

Input Data:
CAL3QHC model input parameters recommended for revision in the 2005 update are:

1. Background CO

2. Persistence Factors

3. Traffic Data

Background CO: In reviewing its currently used methodology for deriving background CO levels, DEQ has concluded that it fails to model the intended worst-case measured 1-hour CO value. To correct for this oversight, DEQ has devised a new methodology which used the highest 1-hour value over a three-year period of CO measurements. The resultant recommended values by DEQ are detailed in a January 8, 2004 memo (See Attachment C).

Persistence Factor: In reviewing the persistence factor values cited in the 2001 PLAQ procedures, it was pointed out that there was some confusion concerning the intent for specifying 8-hour background values (since they are not an input value to the CAL3QHC model) as well as some uncertainty concerning how either the 1-hour and 8-hour background values were derived. To clarify this issue, DEQ has recommended that the 8-hour background values be replaced by persistence factors. It was further recommended that these factors be derived from the ratio of the 8-hour to the maximum 1-hour measured CO concentration within an 8-hour period for each of the ten highest non-overlapping 8-hour concentrations from the latest three CO seasons of monitoring data. The resultant recommended values by DEQ are detailed a January 8, 2004 memo (See Attachment C).

Traffic Data: In reviewing existing CAL3QHC input data for reasonableness, the following updates to default traffic inputs values were deemed appropriate to establish consistency and/or to better coincide with EPA and HCM 2000 guidance:

Average Cycle Length:	100 seconds
Average Red Time:	60 seconds for thru move, 90 seconds for left turns
Saturation Flow Rate:	1800 vehicles per hour
Signal Type:	Pre-timed
Turn Lanes:	10% of approach volume assigned to each movement
Directional Factor (D)	50% of volume in each direction
Design Hour Factor (K)	Design hour volume = 9% of AADT in urban areas Design hour volume = 10% of AADT in rural areas

A complete listing of the recommended CAL3QHC inputs including default values for use either for developing screening volumes or for modeling project level emissions concentrations in instances where site specific data is not known are presented in Attachment D.

METHODOLOGY:

The theory behind the concept of using screening volumes in lieu of air quality analyses is that one can, with reasonable accuracy, use the emissions modeling results (developed with the CAL3QHC dispersion model) for a limited number of highway configurations and traffic conditions to make assessments of the project level air quality implications of a broader range of highway projects and conditions. To support this theory, some level of testing, documentation, and evaluation is necessary.

<u>Range of Application:</u>

The first step taken in assessing the range of application of the screening volumes was to establish what roadway types and configurations, operating under current or forecast traffic conditions likely in Idaho, could potentially result in carbon monoxide concentrations in excess of the NAAQS at receptor locations (e.g., where pedestrians or intakes for buildings might reasonably be found). A summary of findings from this preliminary testing is as follows:

Freeways: Characteristics of freeways include:

1. No accommodation for pedestrian traffic (e.g. sidewalks) within the right of way.
2. No at-grade intersections or associated queuing due to stop controls (e.g. traffic signals).
3. Significant separation between the travel lanes and potential receptor locations.
4. Multiple lanes and high volumes of traffic (e.g. 4 to 10 lanes and 40k to 120k AADT).
5. Continuous traffic flow (no queues assumed).

In conducting project level dispersion modeling of a variety of freeway configurations assuming the above conditions, it was concluded that within Idaho no exceedances of the carbon monoxide NAAQS would likely occur.

Arterials - Freeflow links: Characteristics of arterial freeflow links include:

1. Accommodation of pedestrians (e.g. sidewalks) adjacent to the travel lanes may occur.
2. At-grade intersections of connecting side roads with stop controls (stop signs) for the connecting side roads only but not the arterial.
3. A range of separation (0 to 50+ feet) between the travel lanes and potential receptor locations (e.g. sidewalks).
4. Multiple lanes and moderate to high volumes of traffic (e.g., 4 to 6 lanes and 20k to 60k AADT).
5. Continuous traffic flow on arterial and limited queues on stop-controlled intersecting side roads.

In conducting project level dispersion modeling of a variety of arterial configurations assuming the above conditions, it was concluded that within Idaho no exceedances of the carbon monoxide NAAQS would likely occur. With respect to the specific situation of stop-controlled side roads intersecting arterials, it was resolved that such roads would typically be of sufficiently low volume that no reasonable potential for exceedance of the carbon monoxide NAAQS existed.

Arterial Intersections: Characteristics of arterial intersections include:

1. Accommodation of pedestrians (e.g. sidewalks) adjacent to the travel lanes may occur.
2. Signalized and unsignalized at-grade intersections of connecting arterials and other side roads resulting in queuing on all approaches to the intersection.
3. A range of separation (0 to 50+ feet) between the travel lanes and potential receptor locations (e.g. sidewalks).

4. Multiple lanes and moderate to high volumes of traffic (e.g., 4 to 6 lanes and 20k to 60k AADT).
5. Continuous traffic flow on arterial and limited queues on stop-controlled intersecting side roads.

In conducting project level dispersion modeling of a variety of arterial intersection configurations and assuming the above conditions, it was concluded that within Idaho there does exist the potential for exceedances of the carbon monoxide NAAQS. It was further resolved that the potential for such exceedances was principally limited to signalized intersections since intersections not having signalized control were characteristically low in volume and therefore were not likely to result in exceedances of the carbon dioxide NAAQS.

Refinement of Test Configurations:

Having first narrowed consideration for project level air quality impacts to signalized intersections, the next step was to determine what intersection configuration(s) would be most appropriate to analyze for the purpose of developing the screening volumes. In developing the 2001 PLAQ procedures, a four-way intersection comprised of two 5-lane highways with a single left turn lane at each approach was used for developing the screening volumes.

For this 2005 update to the PLAQ procedures, it was decided that further testing should be conducted to compare a range of intersection configurations. Specifically, dispersion modeling was conducted on the following intersection configurations:

3 x 3 Intersection:
An intersection of two 3-lane roadways with two travel lanes, a continuous center turn lane, and having a single left turn lane at each approach to the intersection.

5 x 5 Intersection:
An intersection of two 5-lane roadways with four travel lanes, a continuous center turn lane, and having a single left turn lane at each approach to the intersection.

6 x 6 Intersection:
An intersection of two 5-lane roadways with four travel lanes, a continuous center turn lane, and having dual left turn lanes at each approach to the intersection.

7 x 7 Intersection:
An intersection of two 5-lane roadways with four travel lanes, a continuous center turn lane, and having dual left turn lanes and a single right turn lane at each approach to the intersection.

9 x 9 Intersection:

An intersection of two 7-lane roadways with six travel lanes, a continuous center turn lane, and having dual left turn lanes and a single right turn lane at each approach to the intersection.

RESULTS:

Emissions modeling using EPA's CAL3QHC model was performed on the five intersection configurations identified in the previous section using the analysis years of 2005 and 2025 and assuming equal traffic volumes at each approach with a volume test range beginning at 1,200 vehicles per hour and increasing in increments of 100 vehicles per hour until the Carbon Monoxide standard was exceeded. The outcome for each modeling run was expressed in terms of the predicted maximum concentrations of carbon monoxide (in parts per million) within the intersection area over a one hour and an eight hour period (See Attachment E).

Discussion:

An overview of the results of the 2005 and 2025 analyses of the five intersections is as follows:

1. The 1 hour carbon monoxide NAAQS was not exceeded in either the 2005 or 2025 analysis years for any of the five intersection configurations. The implication of this result is that the 1 hour standard is not likely to be a limiting factor in project level analysis. Based on this observation it is concluded that the 1 hour standard need not be considered for establishing the screening volumes in Idaho.

2. The 8 hour carbon monoxide NAAQS was not exceeded in the 2025 analysis year for any of the five intersection configurations until the volume to capacity (v/c) ratio was approximately 2.0. This ratio is so high that it can be considered infeasible, even in Idaho's larger urban areas. Therefore, it is concluded that there is no feasible volume above which a project level analysis is warranted in Idaho for the project design year (2025 or later).

3. The 8 hour carbon monoxide NAAQS was not exceeded for the 3 x 3 intersection configuration at any locations until the v/c ratio was approximately 2.5. This ratio is so high that it can be considered infeasible, even in Idaho's larger urban areas. Therefore, it is concluded that there is no feasible volume above which a 3 x 3 intersection warrants a project level analysis in Idaho.

4. The 8 hour carbon monoxide NAAQS was not exceeded in the 2005 year analysis in the Rural, Small Urban, and Large Urban areas for any of intersection configurations under consideration until the v/c ratio was approximately 1.3 for the 9 X 9 intersection configuration and 2.0 for the

remaining configurations. It is unlikely that a 9 X 9 intersection will be planned for any the above areas and even more unlikely that it would have a volume to capacity ratio in excess of 1.0. Therefore, it is concluded that there is no feasible volume above which a project level analysis is warranted in the Rural, Small Urban or Large Urban Areas of Idaho.

5. The 8 hour carbon monoxide NAAQS was exceeded in the Ada County, Canyon County, and Lewiston areas in 2005 for the remaining intersection configurations under consideration for screening volumes (5 x 5, 6 x 6, 7 x 7, and 9 x 9). Furthermore, it was noted that the Ada County, Canyon County and Lewiston area results were very similar with Canyon County having slightly higher concentrations among these three. Therefore it is concluded that for Ada County, Canyon County and Lewiston a common screening volume for the 2005 analysis year can be used and that it should be based on the Canyon County results.

Assumptions and Limitations:

The scope of the analyses described above is dependent on a number of assumptions which, in turn may introduce some limitations to application of the resultant screening process and criteria. A discussion of the most significant assumptions and limitations is provided below:

1. Intersection Configuration:

   a. Number of Approaches:
   The modeling analyses assumed that all intersections were comprised of two roadways intersecting in a perpendicular alignment. It was resolved that for high volume roadways, four-way intersections are by far the most common configuration and that these intersections are likewise most often perpendicular in alignment. With respect to assumption of a four-way intersection, the resultant screening values will be overly conservative when applied to intersections with less than four approaches (e.g., for intersections with one-way roads or having “T” intersections). For intersections having more than four approaches, some caution and judgment will be necessary in deciding whether the screening volumes usable, particularly if the intersection has volume approaching the screening limits. One adaptation that could be considered in such a case would be to assign the total volume passing through the intersection to four assumed approaches.

   b. Number of Lanes:
   The modeling analysis assumed that each approach to the intersection has an equal number of through and turn lanes. While this is often not the case, the recommended strategy in such situations would be to have the

approach with the greatest number of lanes serve as the basis for defining the intersection configuration to be assumed.

c. Turn Lane Types:
The range of intersection configurations analyzed reflects the most common types to the roadway system. While there are additional lane combinations that were not tested (e.g., two through lanes with one left turn lane and one right turn lane) it has been resolved that for the purposes of this application, it will be reasonable to assume that turn lanes can be considered to have comparable impacts to emissions concentrations, regardless of whether they are left or right turn lanes. Therefore, the screening volumes will be reasonable provided that the total number of turn lanes for a given intersection approach matches the number assumed in developing the screening volumes.

2. Traffic Volumes and Volume Distribution:

The modeling analysis assumed that the volume on the intersecting roads was equal and that the directional distribution of the volume was 50 percent. In reality, one roadway will always carry more volume than another and the volume distribution for each will vary somewhere in the range of 50 to 70 percent. In application, it is recommended that the highest volume of the intersecting roadways be compared with established screening volumes, thus producing a worst-case conservative result.

3. Signal Timing:

Numerous assumptions on signal timing operation have had to be made to conduct the analyses leading to the establishment of the screening volumes. These values are based on recommended representative values as provided in the Highway Capacity Manual (HCM2000) (See Attachment D for details).

4. Application of Analysis Years:

The screening volumes were based on an assumed project completion year of 2005. Considering that emissions factors will steadily increase in successive years, the above approach results in a conservative evaluation for projects having an actual completion date later than 2005. At some point when it is judged that the current screening volumes are too conservative for their intended application, new analyses will need to be conducted to develop updated values.

<u>Peak Hour Volume versus Daily Traffic Volume:</u>

The unit of traffic volume input into the CAL3QHC model is vehicles per hour which represents the peak, one-way volume for each approach to an intersection (typically the

30th highest hour of the day). Conversely, traffic volumes are most commonly measured and reported as Annual Average Daily Traffic (AADT) which represents the annual average two-way traffic volume for a given roadway. Therefore it may be advantageous to express screening volumes in terms of AADT rather than in terms of peak hour volume.

The relationship between peak (one-way) hourly volume and AADT is defined by what are referred to as the K factor, which represents the proportion of the AADT occurring in the design analysis hour (typically the 30th highest hourly volume of the year), and the D factor, which represents the directional distribution of traffic during the design analysis hour. For a given peak (one-way) hourly volume, the AADT can be derived by dividing the hourly volume by both the K factor and the D factor. In researching this issue, it was determined that where local data is not available, the default K factor should be 9 percent for urban areas and 10 percent for rural areas and, similarly, the D factor should be 60 percent (ref. Transportation Research Board's Highway Capacity Manual 2000).

While the above recommended K factors were used throughout this analysis, a more conservative value of 50 percent was used for the D factor in the interest simplifying the analysis.

ATTACHMENT D

IDAHO’S MOBILE 6.2 INPUTS: RECOMMENDED VALUES

IDAHO'S MOBILE 6.2 INPUTS: RECOMMENDED VALUES

ADA COUNTY		
Parameter	**Value**	**Comments**
Calendar Year	Estimated project completion date	Design year analysis not necessary
Pollutants	CO	Carbon Monoxide
Starts	No start emissions	Pg 44, EPA MOBILE6 Technical Guidance (EPA420-R-04-013)
Fleet Mix	Contact COMPASS MPO Staff	
Evaluation Month	1	January
Min/Max Temps	Contact COMPASS MPO Staff	
Fuel RVP	Contact COMPASS MPO Staff	
Fuel Program	Contact COMPASS MPO Staff	
Average Speed	Freeflow Speed Site Specific (default value 30 mph) Queued vehicle speed 2.5 mph	30 mph represents typical free flow arterial travel speed per HCM2000 Exhibits 10.3 and 10.5; 2.5 mph approximates queued vehicles condition per EPA's Mobile 6 Guidance
Anti-Tamper Program	Contact COMPASS MPO Staff	
I/M Program	Contact COMPASS MPO Staff	
I/M Model Years	Contact COMPASS MPO Staff	
I/M Vehicles	Contact COMPASS MPO Staff	
I/M Stringency	Contact COMPASS MPO Staff	
I/M Compliance	Contact COMPASS MPO Staff	
I/M Waiver Rates	Contact COMPASS MPO Staff	

CANYON COUNTY		
Parameter	**Value**	**Comments**
Calendar Year	Estimated project completion date	Design year analysis not necessary
Pollutants	CO	Carbon Monoxide
Starts	No start emissions	Pg 44, EPA MOBILE6 Technical Guidance (EPA420-R-04-013)
Fleet Mix	Contact COMPASS MPO Staff	
Evaluation Month	1	January
Min/Max Temperature	Contact COMPASS MPO Staff	
Fuel RVP	Contact COMPASS MPO Staff	
Fuel Program	Contact COMPASS MPO Staff	
Average Speed	Freeflow Speed Site Specific (default value 30 mph) Queued vehicle speed 2.5 mph	30 mph represents typical free flow arterial travel speed per HCM2000 Exhibits 10.3 and 10.5; 2.5 mph approximates queued vehicles condition per EPA's Mobile 6 Guidance

LEWISTON		
Parameter	**Value**	**Comments**
Calendar Year	Estimated project completion date	Design year analysis not necessary
Pollutants	CO	Carbon Monoxide
Starts	No start emissions	Pg 44, EPA MOBILE6 Technical Guidance (EPA420-R-04-013)
Fleet Mix	Default	Mobile 6 Default Fleet Mix
Evaluation Month	1	January
Min/Max Temperature	41.1/65.8	Average min/max temperatures for 10 days with highest CO concentrations over a 3 year period
Fuel RVP	15.0	Winter fuel
Fuel Program	3	Conventional Gasoline West
Average Speed	Freeflow Speed Site Specific (default value 30 mph) Queued vehicle speed 2.5 mph	30 mph represents typical free flow arterial travel speed per HCM2000 Exhibits 10.3 and 10.5; 2.5 mph approximates queued vehicles condition per EPA's Mobile 6 Guidance

ATTACHMENT E:

IDAHO'S CAL3QHC INPUTS: RECOMMENDED VALUES

IDAHO'S CAL3QHC INPUTS: RECOMMENDED VALUES

IDAHO'S CAL3QHC INPUTS		
PARAMETER	**VALUE**	**COMMENTS**
Meteorological Data:		
Averaging Time	60 minutes	Corresponding to 1 hour forecast period.
Surface Roughness	Site specific Default value: 175 cm	See EPA's CAL3QHC User Guide, Table 1 (EPA-454/R-92-006) Default values used for establishing Idaho's screening volumes.
Settling Velocity	0 cm/sec Default: same	See EPA's CAL3QHC User Guide, Table 1 (EPA-454/R-92-006)
Deposition Velocity	0 cm/sec Default: same	See EPA's CAL3QHC User Guide, Table 1 (EPA-454/R-92-006)
Wind Speed	1 m/sec Default: same	See EPA's Guidelines for Modeling Carbon Monoxide, pg 4-8 (EPA-454/R-92-005)
Stability Class	D or E Default : E	See EPA's Guidelines for Modeling Carbon Monoxide, pg 4-8 (EPA-454/R-92-005)
Mixing Height	1000 M Default: same	See EPA's Guidelines for Modeling Carbon Monoxide pg 4-8 (EPA-454/R-92-005)
Wind Direction	Location specific Default: 360 degrees in 10 degree increments.	See EPA's Guidelines for Modeling Carbon Monoxide, pg 4-8 (EPA-454/R-92-005)

IDAHO'S CAL3QHC INPUTS		
PARAMETER	**VALUE**	**COMMENTS**
Emissions Data:		
Freeflow Emissions Factors (g/mi)	Location specific	Determined from Mobile 6.2
Queued Emissions Factor (g/hr)	Location specific	Determined from Mobile 6.2
1-hour Background Emissions (ppm) and Persistence Factors (PF)	Location Specific Default Values: Area Background PF Boise: 10.7 ppm, 55 % Nampa: 16.7 ppm, 38 % Lewiston: 9.6 ppm, 54 %	Recommended values from Idaho Department of Environmental Quality
Site Data:		
Roadway Coordinates	Site specific	See EPA's CAL3QHC User Guide, pgs 9-10 (EPA-454/R-92-006)
Roadway Width	Site specific Default values: 12 ft lanes, no shoulders	See EPA's CAL3QHC User Guide, pgs 9-10 (EPA-454/R-92-006)
Receptor Coordinates	Site Specific Default values: 10 foot offset from travel way at intersection and 100 feet from intersection for each approach.	See EPA's Guidelines for Modeling Carbon Monoxide, pg 2-2 (EPA-454/R-92-005)
Source Height	0 m Default: same	See EPA's CAL3QHC User Guide, pg 34 (EPA-454/R-92-006)
Receptor Height	1.8 m Default: same	See EPA's Guidelines for Modeling Carbon Monoxide, pg 2-2 (EPA-454/R-92-005)

IDAHO'S CAL3QHC INPUTS

PARAMETER	VALUE	COMMENTS
Traffic Data:		
Traffic Volume	Site Specific Default: none	
Avg Cycle Length	Site Specific Default: 100 sec.	HCM2000, Exhibit 10-16
Avg Red Time	Site Specific Default: 60 sec. thru and right turns, 90 sec. left turns	Assume equal phases for all four approaches
Clearance Lost Time	Site Specific Default: 2 sec. (per phase)	HCM2000, Exhibit 10-17 and EPA's CAL3QHC User Guide, pg 34 (EPA-454/R-92-006)
Saturation Flow Rate	Site Specific Default: 1800	HCM2000, Exhibit 10-19
Signal Type	Site Specific Default: 1 (pre-timed)	EPA's CAL3QHC User Guide, pg 43 (EPA-454/R-92-006)
Arrival Rate	Site Specific Default: 3 (average progression)	EPA's CAL3QHC User Guide, pg 43 (EPA-454/R-92-006)
% Turns	Site Specific Default: assign 10% of intersection approach volume to each turn movement.	HCM2000 pg 10-19

EXHIBIT 600-1 List of Contacts

ITD, FHWA, IDEQ and COMPASS Air Quality Statewide Contacts:

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208.334.1691-Facsimile

Air Quality Conformity Specialist
ITD Headquarters
3030 State Street
Boise, ID 83703
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Principal Planner, Modeling
COMPASS
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208.855.2558
208.855.2559-Facsimile

Transportation Conformity and Air Quality Specialist
IDEQ-State Office
1445 North Orchard
Boise, ID 83706-2239
208.373.0465-Voice

IDEQ Regional Office Contacts:

Transportation Conformity and Air Quality Specialist
IDEQ-Lewiston Regional Office
1118 F Street
Lewiston, ID 83501
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208.799.3451-Facsimile

EXHIBIT 600-2 Sample Consultant Scope of Work for Air Quality Studies

(*An air quality study is required only in the event the project does not satisfy the July 13, 2005 Project Level Air Quality Screening process)*

The air quality impact analysis will follow the Idaho Environmental Process Manual (EPM) guidelines, except when directed otherwise by this contract. This analysis will be performed only for the **"project's estimated completion date"**.

All build alternatives will be evaluated if they do not satisfy the screening process but only if the alternatives do not meet the screening criteria

If analysis is needed, the existing air quality and pollution sources will be described. Air quality impacts from construction activities and vehicles operating on the roadway will be evaluated qualitatively. Temporary air quality impacts during construction will be examined and mitigation measures to control fugitive dust will be discussed in relation to evaluation and implementation of best management practices.

The long-term impacts from changes in vehicular traffic operating on the roadway will be discussed. Monitoring and modeling of air pollutants other than carbon monoxide (CO) is not proposed.

Studies and Coordination

The air quality analysis will meet the requirements of and follow EPA guidelines. The microscale analysis will be performed to determine carbon monoxide (CO) concentrations using the USEPA CAL3QHC or other EPA approved computer models. Vehicular emissions will be computed by using the EPA's latest emission factor algorithm. The intersections selected for modeling and the corresponding receptor siting will be based on traffic volume as supplied by ITD Traffic Section.

As a general rule, receptors should be located where the maximum total project concentration is likely to occur and where the general public is likely to have access. Examples of reasonable receptor sites include:

1. Sidewalks;
2. Vacant lots adjacent to intersections;
3. Parking lots; and
4. Sensitive buildings and properties, such as residences, hospitals, nursing homes, schools, and playgrounds.

The longitudinal location of the receptors should be as follows:

1. At the intersection corner,
2. 25 meters from the intersection corner,
3. 50 meters from the intersection corner, and
4. At mid-block.

Laterally, the receptors should be located as found on the ground but no closer than the edge of the mixing zone (3.01 meters outside the traveled way).

The CONSULTANT will include traffic data (as collected/approved by the ITD Traffic Section) to determine LOS, congested areas or intersections at peak hour traffic volumes. The analysis will include:

- Description of intersections selected,
- Description of figure showing receptor locations,
- Identification of models used,
- 1-hour and 8-hour maximum pollutant concentrations at each intersection for each modeling scenario.

Documentation of the analysis will be as provided in the Documentation section of PROJECT LEVEL AIR QUALITY SCREENING, ANALYSIS, AND DOCUMENTATION FOR ROADWAY PROJECTS IN IDAHO EFFECTIVE: SEPTEMBER 4, 2001 OR AS REVISED.

650.02 Mobile Source Air Toxics-On major projects it may be appropriate to address air toxics.

In addition to the National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g. dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. See document No. EPA420-R-00-023 (December 2000).

EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. See document No. EPA400-F-92-004 (August 1994). More recently EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act, and the rule's preamble provides the following summary information regarding the effects and control of MSATs:

Today's action addresses emissions of hazardous air pollutants (HAPs) from motor vehicles and their fuels. Hazardous air pollutants refer to a range of compounds that are known or suspected to have serious health or environmental impacts. Motor vehicles are significant contributors to national emissions of several hazardous air pollutants, notably benzene, formaldehyde, 1,3-butadiene, acetaldehyde, and diesel particulate matter and diesel exhaust organic gases.

In today's action, we list 21 compounds emitted from motor vehicles that are known or suspected to cause cancer or other serious health effects. Our Mobile Source Air Toxics (MSAT) list includes various volatile organic compounds (VOCs) and metals, as well as diesel particulate matter and diesel exhaust organic gases (collectively DPM + DEOG). The selection methodology we used to develop this MSAT list, which may be used to add compounds to or remove compounds from the list in the future as new information becomes available, is also described. In today's action we also examine the mobile source contribution to national inventories of these emissions and the impacts of existing and newly promulgated mobile source control programs, including our reformulated gasoline (RFG) program, our national low emission vehicle (NLEV) standards, our Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and our proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 1990 and 2020, we project these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 67 to 76 percent, and will reduce on-highway diesel PM emissions by 90 percent.

In the 2001 rulemaking, EPA identified six priority MSATs: acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1, 3 butadiene (66 FR 17230). EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Under the proposed revised Carcinogen Risk Assessment Guidelines (U.S. EPA, 1996), **benzene** is characterized as a known human carcinogen.
- Under the Draft Revised Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), the potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- Under EPA's 1999 Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Using U.S. EPA's revised draft 1999 Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), **diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

As noted, EPA is the lead Federal government agency responsible for the establishment of national air quality standards, national guidance and guidelines for the uniform and scientifically reliable study of air pollutants. To date, neither National Ambient Air Quality Standards for MSATs nor national project level guidelines or guidance to study MSATs under various climatic and geographic situations have been developed. Such limitations make the study of MSAT concentrations, exposures, and health impacts difficult and uncertain. Thus, accurate and reliable estimates of actual human health or environmental impacts from transportation projects and mobile source air toxics are not scientifically possible at this time.

EPA has also not established toxicity factors for diesel particulate matter, although one study asserts that this pollutant accounts for a large portion of MSAT health risk in certain situations, using a toxicity factor that is unique to California.

Air Toxics

Project Level MSAT Discussion

The analysis of air toxics is an emerging field. The U.S. Department of Transportation (DOT) and EPA are currently working to develop and evaluate the technical tools necessary to perform air toxics analysis, including improvements to emissions models and air quality dispersion models. Limitations with the existing modeling tools preclude performing the same level of analysis that is typically performed for other pollutants, such as carbon monoxide. FHWA’s ongoing work in air toxics includes a research program to determine and quantify the contribution of mobile sources to air toxic emissions, the establishment of policies for addressing air toxics in environmental reports, and the assessment of scientific literature on health impacts associated with motor vehicle toxic emissions.

Unavailable Information for Project Specific MSAT Impact Analysis

The science and modeling of project specific MSAT impacts has not developed to the point where there is certainty or scientific community acceptance. Accordingly, information on MSAT impacts is not available, and the means to obtain this information have not been fully developed. When this is the case, 40 CFR 1502.22(b) requires FHWA to address four provisions: 1) A statement that such information is incomplete or unavailable; 2) A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; 3) A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and 4) The agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. These provisions are addressed as follows:

1. Project specific MSAT analysis is an emerging field and the science has not been fully developed and is therefore unavailable. FHWA is aware that MSAT releases to the environment may cause some level of pollution. What is not scientifically definable is an accurate level of human health or environmental impacts that will result from the construction of new transportation facilities or modification of existing facilities. Project-level MSAT risk assessment involves four major steps: emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is currently encumbered by technical shortcomings that prevent a formal determination of the MSAT impacts of this project. The emissions model (MOBILE6.2) is based on limited data raising concerns over the accuracy of the final estimates. Further the particulate emissions rates from MOBILE6.2 are not sensitive to vehicle speed, which is an important determinant of emissions rates (this is a shortcoming for diesel particulate matter, but not the remaining priority MSATs) or acceleration. Given uncertainties in the emissions estimation process, subsequent calculated concentrations would be equally uncertain. But beyond this, the available dispersion models have not been successfully validated for estimating ambient concentrations of particulate matter or reactive organic MSATs. Available exposure models are not well designed to simulate roadside environments. Finally, the toxicity value of at least one of the priority MSATs, that of diesel particulate matter, has not been nationally established, which would prevent the determination of health impacts of this pollutant even if the other necessary tools were available. Thus, current scientific techniques, tools, and data make it impossible to accurately estimate actual human health or environmental impacts from MSATs that would result from a transportation project.
2. Without this project specific MSATs analysis, it is impossible to quantitatively evaluate the air toxic impacts at the project level. Therefore, this unavailable or incomplete information is very relevant to understanding the "significant adverse impacts on the human environment," since the significance of the likely MSAT levels cannot be assessed.

3. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with negative health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate negative health outcomes when exposed to large doses. There have been other studies and papers that suggest MSATs have health impacts. However, noting that unresolved issues still remain, the Health Effects Institute, a non-profit organization jointly funded by EPA and industry, has undertaken a major series of studies to determine whether MSAT hot spots exist and what the health implications are if they do. The final summary of these studies is not expected to be completed for several more years.

Recent studies have been reported to show that close proximity to roadways is related to negative health outcomes -- particularly respiratory problems[1]. Yet these studies are often not specific to MSATs. Instead they have encompassed the full spectrum of both criteria pollutants and other pollutants. Thus it is impossible to determine whether MSATs are responsible for the health outcomes or the criteria pollutants.

There is also considerable literature on the uncertainties associated with the emissions modeling process. The most significant of these is an assessment conducted by the National Research Council of the National Academy of Sciences, entitled “Modeling Mobile-Source Emissions” (2000). This review noted numerous problems associated with then current models, including the predecessor to the current MOBILE 6.2 model. The review found that, “significant resources will be needed to improve mobile source emissions modeling.” The improvements cited include model evaluation and validation, and uncertainty analysis to raise confidence in the model’s output. While the release of MOBILE 6.2 represents an improvement over its predecessor, the MSAT emission factors have not been fully validated due to limits on dispersion modeling and monitoring data. The MOBILE 6.2 model is currently being updated and its results will not be evaluated and validated for several years.

4. Even though there is no accepted model or accepted science for determining the impacts of project specific MSATs, as noted above, EPA predicts that its national control programs will result in meaningful future reductions in MSAT emissions, as measured on both a per vehicle mile and total fleet basis. FHWA believes that these projections are credible, because the control programs are required by statute and regulation. Also, since all of the Build Alternatives result in reduced VMT in the project area relative to the No Build Alternative, FHWA is confident that MSAT emissions will also be lower in the project area in the design year under those alternatives. As this project involves new connector roadways, there could be slightly elevated but unquantifiable increases in MSATs to residents and others in a few localized areas where VMT increase, which may be important particularly to any members of sensitive populations. However, there will likely be decreases in MSAT emissions in locations where VMT are reduced. Because MSAT emissions on a per VMT basis are expected to decline due to EPA’s control program, and because each of the Build Alternatives would result in a nearly equal reduction in VMT relative to the No Build Alternative, FHWA does not believe that there will be significant adverse impacts on the human environment.

[1] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

Additional information regarding air toxics can be found at
http://www.epa.gov/ttn/atw/eparules.html